

Preliminary Amendment

Applicant: Cory Watkins et al.

Filed: Herewith

Docket No.: A126.108.102

Title: CONFOCAL 3D INSPECTION SYSTEM AND PROCESS

Continuation Application of:

Applicant: Cory Watkins et al.

Serial No.: 10/196,335

Filed: July 16, 2002

Title: CONFOCAL 3D INSPECTION SYSTEM AND PROCESS

IN THE CLAIMS

Please cancel claims 1-9 and add new claims 10-44 as follows:

1.(Cancelled)

2.(Cancelled)

3.(Cancelled)

4.(Cancelled)

5.(Cancelled)

6.(Cancelled)

7.(Cancelled)

8.(Cancelled)

9.(Cancelled)

10.(New) An inspection device including:

a light source;

a pellicle beamsplitter for receiving light from the light source and redirecting said light;

at least one aperture for receiving light from the pellicle beamsplitter; and

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an imaging system including an object imager including a plurality of lenses, a camera reimager including a plurality of lenses, and a camera for collecting focused light.

11.(New) The inspection device of claim 10, wherein the at least one aperture is an aperture array.

12.(New) The inspection device of claim 11, wherein the aperture array is a one dimensional array of pinholes.

13.(New) The inspection device of claim 11, wherein the aperture array is a two dimensional array of pinholes.

14.(New) The inspection device of claim 11, wherein the aperture array includes one or more pinholes, each pinhole having an associated individual microlens therewith.

15.(New) The inspection device of claim 11, wherein the aperture array is curved to compensate for optical field curvature within the object imager.

16.(New) The inspection device of claim 11, wherein the aperture array is curved to compensate for optical field curvature where the object imager is imperfect.

17.(New) The inspection device of claim 11, wherein the camera is a line scan camera.

18.(New) The inspection device of claim 11, wherein the camera is a TDI line scan camera.

19.(New) The inspection device of claim 11, wherein the camera is an area scan camera.

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20.(New) The inspection device of claim 11, wherein the camera is a CMOS area scan camera.

21.(New) The inspection device of claim 11, wherein the light source includes the means of providing a quasi uniformly luminous area internally imaged into a first stop and which reimages the luminous area into the pupil of the imaging system.

22.(New) The inspection device of claim 11, wherein the light source includes the means of providing a quasi uniformly luminous area internally imaged into a first stop and a reimaged Köhler illumination.

23.(New) The inspection device of claim 21, wherein the means for simultaneous mapping of the angular spectrum of the luminous area into a second stop and which reimages the angular spectrum into the intermediate field located in the imaging system.

24.(New) The inspection device of claim 23, wherein the light source is an illuminator having a filament providing the quasi uniformly luminous area imaged into the first stop inside the illuminator and reimaged into the pupil of the imaging system, and simultaneously mapping the angular spectrum of the luminous area into the second stop and reimaging into the intermediate field located in the imaging system.

25.(New) The inspection device of claim 24, wherein the first stop functions as a numerical aperture, the second stop is a field stop, and the pupil of the imaging system is telecentric.

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26.(New) The inspection device of claim 25, wherein the quasi uniformly luminous area is reimaged into the telecentric pupil of the object imager.

27.(New) The inspection device of claim 11, wherein the light source includes the means of providing a quasi uniformly luminous area imaged into the pupil of the imaging system and a plurality of baffles is employed to limit light outside the useful $A\Omega$ product of the imaging system.

28.(New) The inspection device of claim 11, wherein the light source uses Köhler illumination and a plurality of baffles is employed to limit light outside the useful $A\Omega$ product of the imaging system.

29.(New) The inspection device of claim 23, wherein the light source is an illuminator having an array of one or more bright monochromatic and quasi monochromatic sources providing the quasi uniformly luminous area imaged into the first stop inside the illuminator and reimaged into the pupil of the imaging system and simultaneously mapping the angular spectrum into the second stop and reimaging into the intermediate field located in the imaging system.

30.(New) The inspection device of claim 29, wherein the first stop functions as a numerical aperture, the second stop is a field stop, and the pupil of the imaging system is telecentric.

31.(New) The inspection device of claim 29, wherein the bright monochromatic or quasi-monochromatic source is collimated and directed into the field located in the intermediate focus of the imaging system and whereby an array of lenslettes is employed to create the angular spectrum at each aperture.

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32.(New) The inspection device of claim 31, wherein the apodization of the source is modified.

33.(New) The inspection device of claim 11, wherein the object imager is a dual telecentric object imager.

34.(New) The inspection device of claim 11, wherein the camera reimager is telecentric on the side facing the intermediate focus.

35.(New) The inspection device of claim 34, wherein the object imager is a dual telecentric object imager.

36.(New) The inspection device of claim 35, wherein the camera is one of a line scan camera, a TDI line scan camera, an area scan camera, and a CMOS area scan camera.

37.(New) The inspection device of claim 36, wherein the aperture array is one of a one dimensional array of pinholes, a two dimensional array of pinholes, at least one pinhole, and at least one pinhole where each pinhole includes an associated individual microlens therewith.

38.(New) The inspection device of claim 37, wherein the aperture array is curved to compensate for optical field curvature within the object imager.

39.(New) The inspection device of claim 38, wherein the light source includes an illuminator with a filament designed to provide a quasi uniformly luminous area that is internally imaged into a numerical aperture stop and reimaged into the telecentric pupil of the object

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imager, while the angular spectrum from the filament is mapped into a field stop and reimaged into a field located in the intermediate focus of the imaging system at the aperture array.

40.(New) The inspection device of claim 38, wherein the light source includes an illuminator with a filament designed to provide a quasi uniformly luminous area that is imaged into the telecentric pupil of the object imager, such that the light outside of the useful of $A\Omega$ product of the imaging system is eliminated via a plurality of baffles.

41.(New) The inspection device of claim 38, wherein the light source includes an illuminator with an array of one or more bright monochromatic or quasi monochromatic sources designed to provide a quasi uniformly luminous area that is internally imaged into a numerical aperture stop and reimaged into a telecentric pupil of the object imager, while the angular spectrum from the sources are mapped into a field stop and reimaged into a field located in the intermediate focus of the imaging system at the aperture array.

42.(New) The inspection device of claim 41, wherein the one or more bright monochromatic and quasi monochromatic sources is collimated and directed into a field located in an intermediate focus of the object imager at the aperture array.

43.(New) The inspection device of claim 42, wherein an array of lenslettes is employed to create an angular spectrum at each aperture.

44.(New) The inspection device of claim 43, wherein the apodization of the source is modified.